59. (New) A process according to claim 31 wherein the thickness of the layer, or layers, of thermoplastic resin is/are between 3 and 50 μm.

60. (New) A laminated mild steel strip manufactured by the process according to claim 31.

61. (New) A food, beverage or aerosol can comprising laminated mild steel strip according to claim 60.

REMARKS

The Office Action has been carefully considered. The present amendment is intended to be a complete reply thereto and to place the case in condition for allowance.

Claims 1-30 have been cancelled. Claims 31-61 have been added. Claim 31 has support in originally filed claim 1 and on pages 7-8 of the specification. Claims 32-46 and 49-61 have support in originally filed claims 2-23 and 25-30. Claims 47 and 48 have support in the specification on page 5, second paragraph. Further, those of ordinary skill in the art recognize that silanes have the general structure R-Si-X_3 as recited in claim 48.

THE CLAIMS ARE NOT INDEFINITE

Claims 17, 19, and 24-26 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Regarding claim 17, the Examiner alleges that the phrase "such as" renders the claim indefinite. In new claim 49, which is has support in claim 17, "such as" has been removed from the claim.

Regarding claim 19, the Examiner alleges that the phrase "prior to organic resin coating" is vague and indefinite because it is not clear if "organic resin coating" refers to the thermoplastic resin coating or some other coating. In new claim 51, which has support in claim 19, "thermoplastic resin coating" is specifically recited.

Regarding claim 24, the Examiner alleges that the limitation "the chemically-treated strip is coated with thermoplastic resin together with a bonding layer" is vague and indefinite. Claim 24 has been cancelled and does not have a substitute new claim.

Therefore, for the reasons given above, the claims are now definite.

THE CLAIMS ARE NOT ANTICIPATED

Claims 1, 6, 7, 13, 14, 17-20, 24, and 29 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 2,588,234 to Henricks. Claims 1-3, 6-7, 12-14, 19-20, and 27-30 stand rejected under 35 U.S.C. 102(b) as being anticipated by WO 97/16582 to Shimizu et al. (U.S. Patent No. 6,280,852 is used as a working translation). Applicant respectfully traverses the rejections. Although, claims 1-30 have been cancelled, Applicant will address the rejections with respect to the new claims 31-61.

To anticipate a claim, the reference must teach every element of the claim. See MPEP § 2131. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the

claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Both Henricks and Shimizu et al. fail to teach that the first coating layer comprises "***a single layer*** of a non-metallic chemical coating" as required by claim 31. Of the many examples provided by Henricks, only Example XV relates to the preparation of coated mild steel strips. The preparation of the mild steel strip of Henricks requires (1) the formation of a layer of a phosphitic paint on the cleaned metal surface; (2) the application to said phosphitic layer of a paint composition comprising antimony oxide, zinc borate, an alkyd resin and linseed oil amongst other components to form a second layer on the metal surface; (3) the application of a coating of hot paraffin containing 30% calcium stearate; and (4) the formation of a coating by deep drawing the sheet through an aqueous solution containing sodium stearate and borax.

The sheet of Henricks is characterized by two oxyanion containing layers, the second layer of which also contains a thermoplastic alkyd resin. The paraffin/calcium stearate layer is not a thermoplastic resin. A fourth layer comprising sodium stearate and borax is also present. Henricks does not teach or suggest the preparation of a laminated mild steel sheet having a first coating layer comprising ***a single layer*** of an oxyanion on the cleaned metal surface and having a second coating layer thereover comprising a thermoplastic resin.

Shimuzu et al. teach the preparation of laminated steel sheets having a first layer of metallic chromium on the cleaned metal surface, and then having a second layer of chromium oxide thereover. A layer of thermoplastic resin may then be applied to the chromium oxide layer. Shimuzu et al. do not teach laminated mild steel strips according to amended claim 31 of

the invention having a coating comprising ***a single layer*** of an oxyanion applied to the cleaned metal surface and ***a single layer*** of a thermoplastic resin applied thereover.

Therefore, for the reasons noted, Henricks and Shimuzu et al. fails to disclose every element of the claimed invention. Accordingly, the rejections under 35 U.S.C. 102(b) should be withdrawn.

THE CLAIMS ARE NOT OBVIOUS

Claims 2-4, 8-12, 17, 21-23, 26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Henricks. Claims 4, 8-11, and 22-23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimuzu et al. Claims 1-4, 6-14, 17-20, and 28-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,305,994 to Murase. Claims 1-4, 6-18, 20, and 27-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,532,159 to Caldwell et al. Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Henricks, Shimuzu et al., Murase, or Caldwell et al. as applied to claim 1 above, and further in view of U.S. Patent No. 3,775,151 to Baker et al. Claim 30 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Henricks, Murase, or Caldwell et al. as applied to claim 29 above, and further in view of WO 97/16582 to Shimuzu et al. Applicant respectfully traverses the rejections. Although, claims 1-30 have been cancelled, Applicant will address the rejections with respect to the new claims 31-61.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the

reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP 2143.

The references, taken alone or in combination, do not disclose or suggest applicant's claimed invention. The deficiencies of Henricks and Shimuzu et al. are discussed above.

Further, there is no motivation to modify any of the references to arrive at the present invention. Example XV of Henricks does not teach or suggest that less than two oxyanion containing layers could be used in the formation of lubricated laminated mild steel sheets, nor does it teach that the alkyd resin could be applied as separate layer. Henricks teaches a skilled person that several coating layers are required to provide adequate lubrication of the mild steel sheet. It would not be obvious to a skilled person in view of Henricks to reduce the number of layers below that disclosed in Example XV, since it would be expected that such reduction would compromise the associated lubricating properties of the laminated sheet of Example XV. The skilled person would have no motivation to modify the teaching of Henricks to arrive at the present invention.

Shimuzu et al. stress the importance of preparing a mild steel sheet having a specific surface area of 1.08 to 1.35 and teaches that this is achieved by the formation of a coating comprising a first layer of metallic chromium and a second layer of chromium oxide. Shimuzu et al. do not teach or suggest that the metallic chromium layer could be omitted and a skilled person would have no motivation for omitting this layer for fear of compromising the value of the specific surface area. It would not be obvious in view of Shimuzu et al. to prepare laminated mild steel sheets according to claim 31 having a

coating comprising ***a single layer*** of an oxyanion and ***a single layer*** of a thermoplastic resin applied thereto. New claims 31 to 61 are therefore not obvious over Shimuzu et al.

Murase teaches a process for forming a multi-layer coating, which comprises the pre-treatment of the cleaned metal surface with an onium compound. The onium compounds consist an ion pair of the onium cation with an anion, which may be an oxyanion (see column 4). None of the examples disclose ***a single layer*** of an onium compound comprising an oxyanion anion applied to the cleaned surface of a mild steel sheet. In fact in each of examples 2 to 5 the mild steel sheet is pre-treated with zinc phosphate prior to the application of the onium compound. In addition Murase applies a multi-layer coat forming paint to the two underlayers.

None of the Examples of Murase disclose laminated mild steel sheets comprising a coating comprising ***a single layer*** of an oxyanion applied to the cleaned metal sheet and a second ***single layer*** of a thermoplastic resin applied there over. It would not be obvious to a skilled person in view of Murase to reduce the number of under layers from 2 to 1 for fear of compromising the corrosion protection afforded to the laminated sheets disclosed therein. In addition there is no suggestion that top coatings other than the multi-layer coatings formed from the multi-layered coat forming paints could be used. Again, a skilled person would be unlikely to omit such multi-layered paint coatings, since he would sensibly surmise that the corrosion protection afforded by the multiple layers was superior to that afforded by fewer layers. It would not be obvious to a skilled person in view of Murase to reduce the number of layers used in the formation of the laminated steel sheet to a single layer comprising an oxyanion having a single layer of a thermoplastic resin there over.

Caldwell et al. disclose the preparation of a paint composition that can be used in the

corrosion protection of steel structures used in construction, such as those, which are exposed to environmental corrosion. Caldwell et al. do not state that the paint compositions can be used in the corrosion protection of mild steel strips used in the preparation of food and beverage packaging, where the considerations in achieving good corrosion resistance are quite different. In structural applications, the paint will wear off and it is possible to reapply a paint to achieve ongoing corrosion resistance. In food applications it is not possible to reapply a corrosion inhibiting coating and a skilled person would not utilize the paints of Caldwell et al. in such applications for this purpose, because of the fear that they would be lost over time.

The paints of Caldwell et al. comprise a mixture of a latex dispersion of a polymeric binder and one or more pigments which may include an oxyacid. The paint mixture is applied to the top of the surface and there is no indication that any separation of the components occurs on application. Caldwell does not disclose a laminated mild steel sheet having a coating comprising ***a single layer*** of an oxyanion applied to the cleaned metal sheet and ***a single layer*** of a thermoplastic resin applied there over. For the reasons given above, Caldwell does not teach or suggest that such laminated mild steel strips of the invention can be prepared and it would not be obvious to a skilled person from Caldwell to prepare laminated mild steel strips in accordance with amended claims 31-61.

Because Hendricks, Shimuzu et al., Murase, or Caldwell et al. are fails to disclose ***a single layer*** of an oxyanion applied to the cleaned metal sheet and ***a single layer*** of a thermoplastic resin applied there over, and this deficiency is not satisfied by Baker et al., the combination of the references does not render the claim obvious.

Therefore, for the reasons noted, the references, taken alone or in combination, do not render the claims obvious. Accordingly, the rejections under 35 U.S.C. 103(a) should be withdrawn.

REFERENCES NOT RELIED UPON BY THE EXAMINER

Applicant acknowledges the references made of record but not relied upon. The Examiner considers these references pertinent to Applicant's disclosure.

U.S. Patent No. 5,657,603 to Goodhart et al. discloses the preparation of a metal sheet for the fabrication of roofing shingles and is mainly concerned with the physical folding processes used in such preparation. At column 9, line 33 the reference discloses that the substrates used are steel and aluminum sheets, which are electrolytically coated with tin and chrome. These surface treated steel sheets are then further treated with, for example, metal phosphates or a mixed metal oxide and then over coated with a thermosetting polymer. Goodhart et al. do not teach or suggest to a skilled person that the electrolytically coated layer can be omitted and it would not be obvious to a skilled person to do so. In addition there is no suggestion that a thermoplastic resin could replace the thermosetting resins of Goodhart et al. and a skilled person would have no motivation to do this, since the hardness of the thermosetting resin and its ability to withstand extreme variations in temperature would contribute to the weather proofing of the roof shingles disclosed therein.

The laminated steel strips of the invention used in the packaging industry are generally stored at constant temperatures do not need to withstand such extreme conditions. A skilled person would have no motivation to replace the thermosetting polymers of Goodhart et al. with thermoplastic resins.

Both U.S. Patent No. 5,238,517 to Heyes and U.S. Patent No. 5,149,389 to Heyes et al. disclose the preparation of laminated steel sheets using sheets onto which a coating of chromium has been formed (see for example, column 2, lines 31 to 52 of Heyes). Such chromically treated starting materials are excluded from the scope of claims 31-61.

U.S. Patent No. 5,135,780 to Kissel describes the deposition of free metals as a gel dispersion onto the surface of a metal. The gel dispersion contains a reducing agent and the deposited metal is in the form of metal particles. The coatings of new claims 31 to 61 do not contain metal particles and it would not be obvious to a skilled person to use the process of Kissel to prepare the coatings of the invention.

CONCLUSION

Applicant has responded to the Office action mailed June 6, 2002. A petition and fee for a three months extension of time is filed herewith. All of the claims are now believed to be allowable and favorable action is respectfully requested.

In the event that there are any questions relating to this Amendment or to the application in general, it would be appreciated if the examiner would telephone the undersigned attorney concerning such questions so that the prosecution of this application may be expedited.

Please charge any shortage or credit any overpayment of fees to BLANK ROME COMISKY & McCAULEY LLP, Deposit Account No. 23-2185 (111869-00113). In the event that a petition for an extension of time is required to be submitted herewith and in the event that a separate petition does not accompany this response, applicant hereby petitions under 37 C.F.R. 1.136(a) for an extension of time for as many months as are required to render this submission timely.

Any fees due are authorized above.

Respectfully submitted,

Date: December 6, 2002 By: _____

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